AMENDMENT TO THE CLAIMS:

This listing of claims will replace all prior versions of claims in the application:

LISTING OF CLAIMS:

1. (CURRENTLY AMENDED) A spin valve (SV) sensor comprising:

a pinned layer having a pinned layer magnetization;

a free layer disposed ~~adjacent~~ towards the pinned layer, the free layer having a free layer magnetization perpendicular to the pinned layer magnetization in the absence of an external field;

a spacer layer disposed between the free layer and the pinned layer;

a pinning layer disposed ~~adjacent~~ towards the pinned layer for fixing the pinned layer magnetization;

an underlayer disposed ~~adjacent~~ towards the pinning layer, the underlayer comprising NiFeX; and

an upper layer disposed adjacent the underlayer and the pinning layer, the upper layer comprising a material selected from the group consisting of NiFe and CoFe for increasing a GMR ratio associated with the SV sensor;

~~wherein the upper layer has a thickness less than 20 A~~

wherein the sensor provides an increase of $\Delta R/R$ of at least 7% when compared to an otherwise identical sensor not having the upper layer.

2. (CURRENTLY AMENDED) The spin valve sensor as recited in claim [[2]] 1, wherein the upper layer has a thickness of at least 4 A.

3. (CURRENTLY AMENDED) The spin valve sensor as recited in claim [[5]] 1, wherein the upper layer has a thickness of ~~no more than 10 A~~ less than 5 A.

4. (CURRENTLY AMENDED) The spin valve sensor as recited in claim 1, wherein the upper layer is doped with a material other than NiFe or CoFe for decreasing an electrical conductivity of the upper layer.

5. (ORIGINAL) The spin valve sensor as recited in claim 1, wherein the underlayer comprises NiFeCr.

6. (ORIGINAL) The spin valve sensor as recited in claim 1, wherein the SV sensor is a component of a disk drive system.

7. (ORIGINAL) The spin valve sensor as recited in claim 1, wherein the underlayer includes 40 +/- 5 Atomic % Cr.

8. (CURRENTLY AMENDED) The spin valve sensor as recited in claim 1, wherein the pinned layer comprises a Ru layer, a first CoFe layer disposed

includes 40 +/- 5 Atomic % Cr.

8. (CURRENTLY AMENDED) The spin valve sensor as recited in claim 1, wherein the pinned layer comprises a Ru layer, a first CoFe layer disposed adjacent a first side of the Ru layer and a second CoFe layer disposed adjacent a second side of the Ru layer.

9. (CURRENTLY AMENDED) The spin valve sensor as recited in claim ~~8,~~ ~~wherein the pinned layer further comprises a first CoFe layer disposed adjacent a first side of the Ru layer and a second CoFe layer disposed adjacent a second side of the Ru layer~~ 1, wherein the upper layer includes both NiFe and CoFe.

10. (CURRENTLY AMENDED) The spin valve sensor as recited in claim 1, wherein ~~the free layer comprises a NiFe layer~~ the underlayer comprises NiFeX where X is not Cr .

11. (CURRENTLY AMENDED) The spin valve sensor as recited in claim ~~10, wherein the free layer further comprises a CoFe layer disposed adjacent the NiFe layer~~ 1, wherein the upper layer is non-magentic.

12. (CURRENTLY AMENDED) A method of fabricating a spin valve (SV) sensor comprising:

depositing an underlayer comprising NiFeX, where X is not Cr;

depositing an upper layer adjacent the underlayer, the upper layer comprising a material selected from the group consisting of NiFe and CoFe for increasing a GMR ratio associated with the SV sensor;

depositing a pinning layer ~~adjacent~~ towards the upper layer;

depositing a pinned layer ~~adjacent~~ towards the pinning layer, the pinned layer having a pinned layer magnetization;

depositing a spacer layer ~~adjacent~~ towards the pinned layer; and

depositing a free layer ~~adjacent~~ towards the ~~pinned~~ spacer layer, the free layer having a free layer magnetization perpendicular to the pinned layer magnetization in the absence of an external field[[;]]

~~wherein the upper layer has a thickness less than 20 A~~.

13. (ORIGINAL) The method as recited in claim 12, wherein the upper layer has a thickness of at least 4 A.

14. (CURRENTLY AMENDED) The method as recited in claim 13, wherein the upper layer has a thickness of no more than ~~10 A~~ 20 A.

15. (CURRENTLY AMENDED) The method as recited in claim 12, wherein the upper layer is doped with a material other than NiFe or CoFe for at least one of reducing an electrical conductivity of the upper layer and reducing magnetic properties of the upper layer.

16. (CURRENTLY AMENDED) The method as recited in claim 12, wherein the ~~underlayer includes NiFeCr~~ upper layer includes both NiFe and CoFe.

17. (CURRENTLY AMENDED) A spin valve (SV) sensor comprising:

a pinned layer having a pinned layer magnetization;

a free layer disposed ~~adjacent~~ towards the pinned layer, the free layer having a free layer magnetization perpendicular to the pinned layer magnetization in the absence of an external field;

a spacer layer disposed between the free layer and the pinned layer;

a pinning layer disposed ~~adjacent~~ towards the pinned layer for fixing the pinned layer magnetization, the pinning layer comprising PtMn;

an underlayer disposed ~~adjacent~~ towards the pinning layer, the underlayer comprising NiFeCr; and

an upper layer disposed adjacent the underlayer and the pinning layer, the upper layer comprising CoFe for increasing a GMR ratio associated with the SV sensor;

wherein the upper layer has a thickness less than ~~20 A~~ 5 A.

18. (CURRENTLY AMENDED) A spin valve (SV) sensor comprising:

a pinned layer having a pinned layer magnetization;

a free layer disposed ~~adjacent~~ towards the pinned layer, the free layer having a free layer magnetization perpendicular to the pinned layer magnetization in the absence of an external field;

a spacer layer disposed between the free layer and the pinned layer;

a pinning layer disposed ~~adjacent~~ towards the pinned layer for fixing the pinned layer magnetization, the pinning layer comprising PtMn;

an underlayer disposed ~~adjacent~~ towards the pinning layer, the underlayer comprising NiFeCr; and

an upper layer disposed adjacent the underlayer and the pinning layer, the upper layer comprising at least one of NiFe and CoFe for increasing a GMR ratio associated with the SV sensor;

wherein the upper layer has a thickness less than [20 A] 5 A.

19. (CURRENTLY AMENDED) A spin valve (SV) sensor comprising:

a pinned layer having a pinned layer magnetization;

a free layer disposed ~~adjacent~~ towards the pinned layer, the free layer having a free layer magnetization perpendicular to the pinned layer magnetization in the absence of an external field;

a pinning layer disposed ~~adjacent~~ towards the pinned layer for fixing the pinned layer magnetization;

an underlayer disposed ~~adjacent~~ towards the pinning layer, the underlayer comprising NiFeCr; and

an upper layer disposed adjacent the underlayer and the pinning layer, the upper layer comprising a material selected from the group consisting of NiFe and CoFe for increasing a GMR ratio associated with the SV sensor;

~~wherein the upper layer has a thickness at least 4 A and less than 20A;~~

wherein the upper layer is doped with a material other than NiFe or CoFe for reducing at least one of an electrical conductivity of the upper layer and magnetic properties of the upper layer.

20. (CURRENTLY AMENDED) A spin valve (SV) sensor comprising:

a pinned layer having a pinned layer magnetization, the pinned layer comprising a Ru layer with a first CoFe layer disposed adjacent a first side of the Ru layer and a second CoFe layer disposed adjacent a second side of the Ru layer;

a free layer disposed ~~adjacent~~ towards the pinned layer, the free layer having a free layer magnetization perpendicular to the pinned layer magnetization in the absence

of an external field, the free layer comprising a NiFe layer with a third CoFe layer disposed adjacent thereto;

a spacer layer disposed between the free layer and the pinned layer;

a pinning layer disposed ~~adjacent~~ towards the pinned layer for fixing the pinned layer magnetization, the pinning layer comprising PtMn;

an underlayer disposed ~~adjacent~~ towards the pinning layer, the underlayer comprising NiFeCr; and

an upper layer disposed ~~adjacent~~ towards the underlayer and the pinning layer, the upper layer comprising a material selected from the group consisting of NiFe and CoFe for increasing a GMR ratio associated with the SV sensor;

wherein the upper layer has a thickness less than 20 A;

wherein the upper layer is doped with a material other than NiFe or CoFe for reducing at least one of an electrical conductivity of the upper layer and magnetic properties of the upper layer;

wherein the sensor provides an increase of $\Delta R/R$ of at least 7% when compared to an otherwise identical sensor not having the upper layer.

21. (CURRENTLY AMENDED) A disk drive system, comprising:

a magnetic recording disk;

a spin valve (SV) sensor including:

a pinned layer having a pinned layer magnetization;

a free layer disposed ~~adjacent~~ towards the pinned layer, the free layer having a free layer magnetization perpendicular to the pinned layer magnetization in the absence of an external field,

a spacer layer disposed between the free layer and the pinned layer,

a pinning layer disposed ~~adjacent~~ towards the pinned layer for fixing the pinned layer magnetization,

an underlayer disposed ~~adjacent~~ towards the pinning layer, the underlayer comprising NiFeX, and

an upper layer disposed adjacent the underlayer and the pinning layer, the upper layer comprising a material selected from the group consisting of NiFe and CoFe for increasing a GMR ratio associated with the SV sensor;

an actuator for moving the SV sensor across the magnetic recording disk so the SV sensor may access different regions of magnetically recorded data on the magnetic recording disk; and

a controller electrically coupled to the SV sensor for detecting changes in resistance of the SV sensor;

wherein the upper layer has a thickness less than 20 A;

wherein the sensor provides an increase of $\Delta R/R$ of at least 7% when compared to an otherwise identical sensor not having the upper layer.